

Semiconductor WEEK

An Overview of Results and Conclusions From Recent Reports at TechInsights



Last Week in the Semiconductor Market

Semiconductor sales grew 5% from last week. The IC weather warmed 3°F to Temperate conditions. Zooming in on Logic this week, the 13-wk MA is down nearly 8%. TechInsights forecasts Logic sales will reach \$273B in 2023 with a Y/Y decline of 2%, coming off a 10% increase in 2022.

TechInsights' IC Supply/Demand held in Tight conditions. Foundry moved to Tight conditions as More Moore Foundry and More than Moore Foundry both moved to Tight conditions. DRAM, NAND, IDM, OSAT, Analog & Power, and Auto IC all remain unchanged.

Electronics' Retail Prices are in a bullish rise.

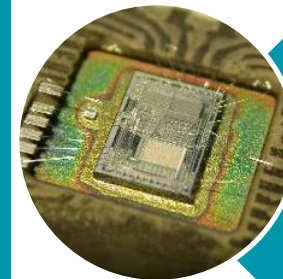
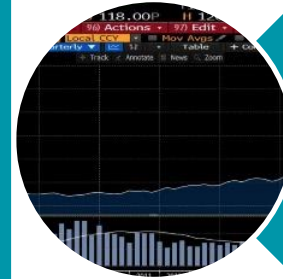


Strategy & Tactics

Chip War and Upturn Timing

Semiconductor Stocks:

- TechInsights' Semiconductor Stock Indices grew this week with Semiconductor, Equipment, and Electronic Materials indices continue to hit new yearly highs.
- Semiconductor Stock Index climbed
- Semiconductor Equipment Stock Index soared
- EDA Stock Index increased
- Electronics Materials Stock Index rose this week
- Hottest Stocks: Silicon Laboratories, AMD, Onto Innovation, ON Semiconductor, Lam Research, Kulicke & Soffa



Chip Market Research Services

Caution dominates decision-making
Order activity for semiconductor equipment held at a brisk 49 degrees
Production and Capacity Plan

Chip History Center

SEMICON Conceived: 2020 marked the 50th Anniversary of SEMI.

Making Silicon Commercially Manufacturable: Without silicon, there wouldn't be chips.



The Chip Insider's® Graphics File

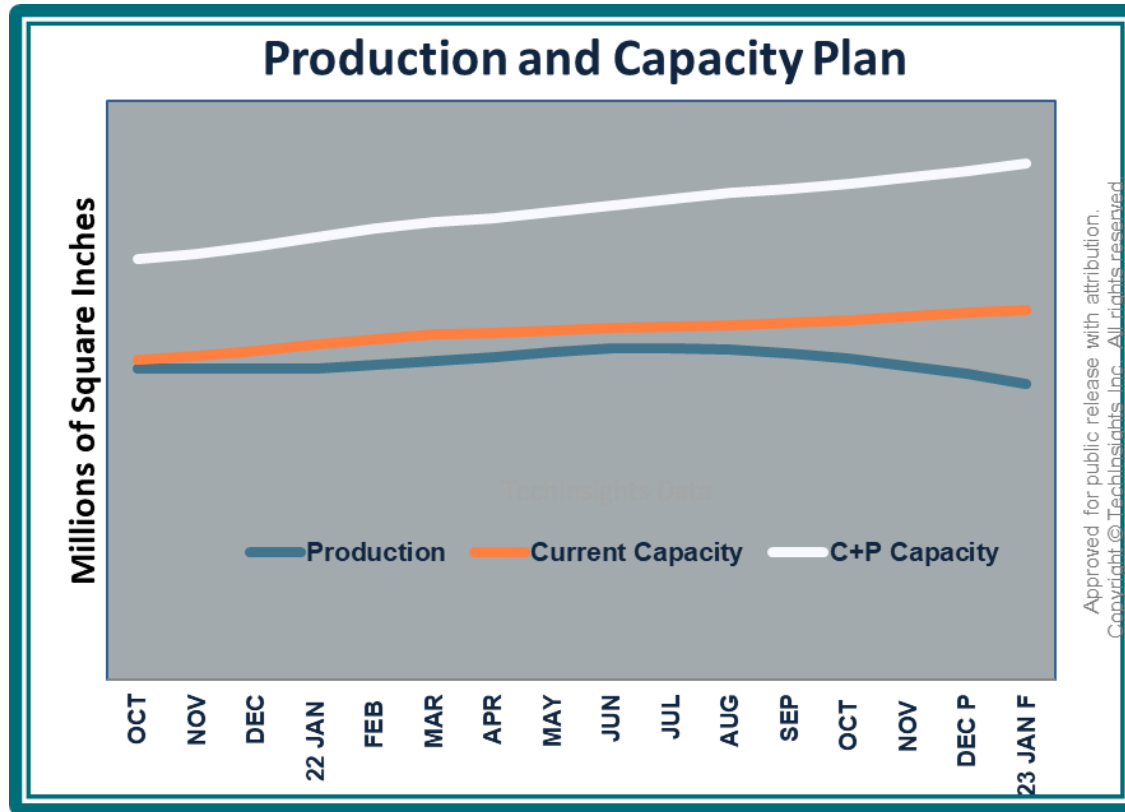
January 2023

Caution dominates decision-making

- Order activity for semiconductor equipment held at a brisk 49 degrees
- Memory slipped another degree in freezing levels while Other SOC compute fell two degrees
- TechInsights' Chip Price Performance Index continued to lose ground, slipping a point in the last week of January

Forecast as of January 2023:	2022	2023
Semi Equipment (\$B):	\$ 135.3	\$ 115.8
Sequential Change	6.6%	-14.5%
Capacity Utilization:	94.1%	85.3%
ICs (\$B):	\$ 513.0	\$ 483.4
Sequential Change	4.2%	-5.8%
IC Units (BU):	406.7	402.6
Sequential Change	3.2%	-1.0%
Electronics (\$B) :	\$ 2,556	\$ 2,451
Sequential Change	-0.7%	-4.1%

The Chip Insider® Graphics



Production and Capacity Plan

Production is turning downwards so companies can digest inventories

Production and Capacity Plan: chart gives rolling averages for semiconductor production, currently active capacity, and current plus planned capacity in millions of square inches of silicon wafers.

Semiconductor Analytics

Last Week in the Semiconductor Market

Semiconductor sales grew 5% from last week. The IC weather warmed 3°F to Temperate conditions. Zooming in on Logic this week, the 13-wk MA is down nearly 8%. TechInsights forecasts Logic sales will reach \$273B in 2023 with a Y/Y decline of 2%, coming off a 10% increase in 2022.

TechInsights' IC Supply/Demand held in Tight conditions. Foundry moved to Tight conditions as More Moore Foundry and More than Moore Foundry both moved to Tight conditions. DRAM, NAND, IDM, OSAT, Analog & Power, and Auto IC all remain unchanged.

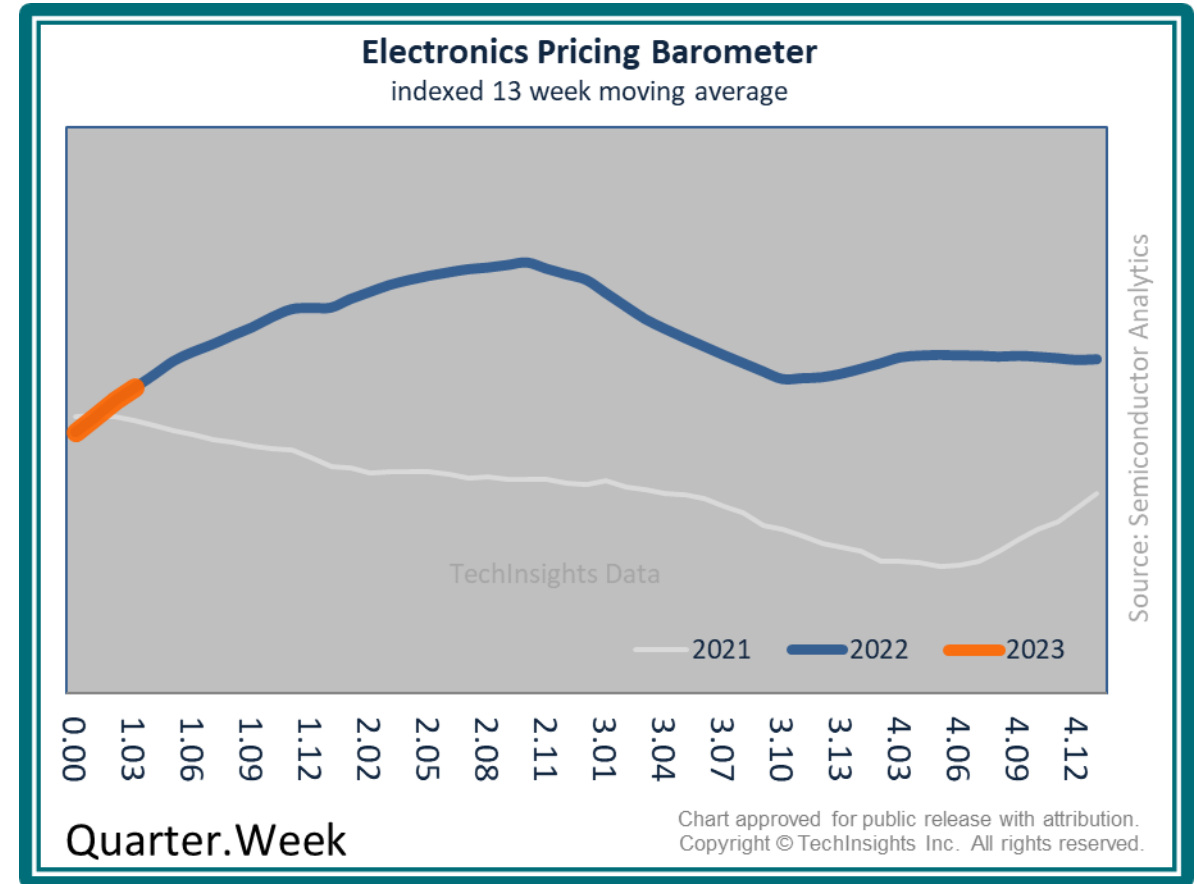
Electronics' Retail Prices are in a bullish rise.



Electronics Retail Pricing Trends

PC Notebooks Tablets, Smartphones, Cell Phones, Digital Cameras, Appliances, TVs

Electronics'
Retail Prices
are in a bullish
rise.





Dan Hutcheson – Vice Chair
The Chip Insider

The Chip Insider®

Strategy & Tactics

Chip War and Upturn Timing

Summaries:

Happenings, Comments, Questions & Answers: Japan and the Netherlands may join the U.S. in semiconductor equipment restrictions to China ... an openly visible move to side with the U.S. would be a significant shift back to the old-world order.

Japan and the US-China Semiconductor War ... Which side do you think Japan falls on the US-China Semiconductor War? ... Japan's economic dependency on a positive relation with China is arguably greater than that of the United States. But Japan also has major national security issues, for which it relies on a strong relationship with the United States... Japan will most likely side with ... Fears of a world united against it will drive China's military strategy to be ...

Upturn timing: Dan, when do you think the upturn will come? Second half of 2023? 2024? ... The second half of 2023 is the

most likely, given the double-known causes of the current slowdown being first, the reverberation from the COVID restructuring for a work-anywhere economy ... the self-inflicted wounds by producing too much, which led to an inventory glut that was visible by July of 2022... It is the known unknowns that have people thinking about another pause that stretches upturn timing into 2024, with the shape of the cycle looking like an ...

SEMI ISS Continued: I've been asked for months how to play the U.S. Chips Act and what the structure would be. Two speakers at SEMI ISS laid it beautifully: one is Laurie Locascio, the Under Secretary for Standards and Technology at the U.S. Department of Commerce and Director of NIST. She gave instructions for how to apply for an incentive. The second was Raj Jammy of MITRE ENGENUITY, who gave the best talk I've seen on what to expect with the governance and organizational structure of the NSTC, which will be a hub-and-spoke network laid out across the United States at various centers of excellence and in his view, possibly outside the U.S.

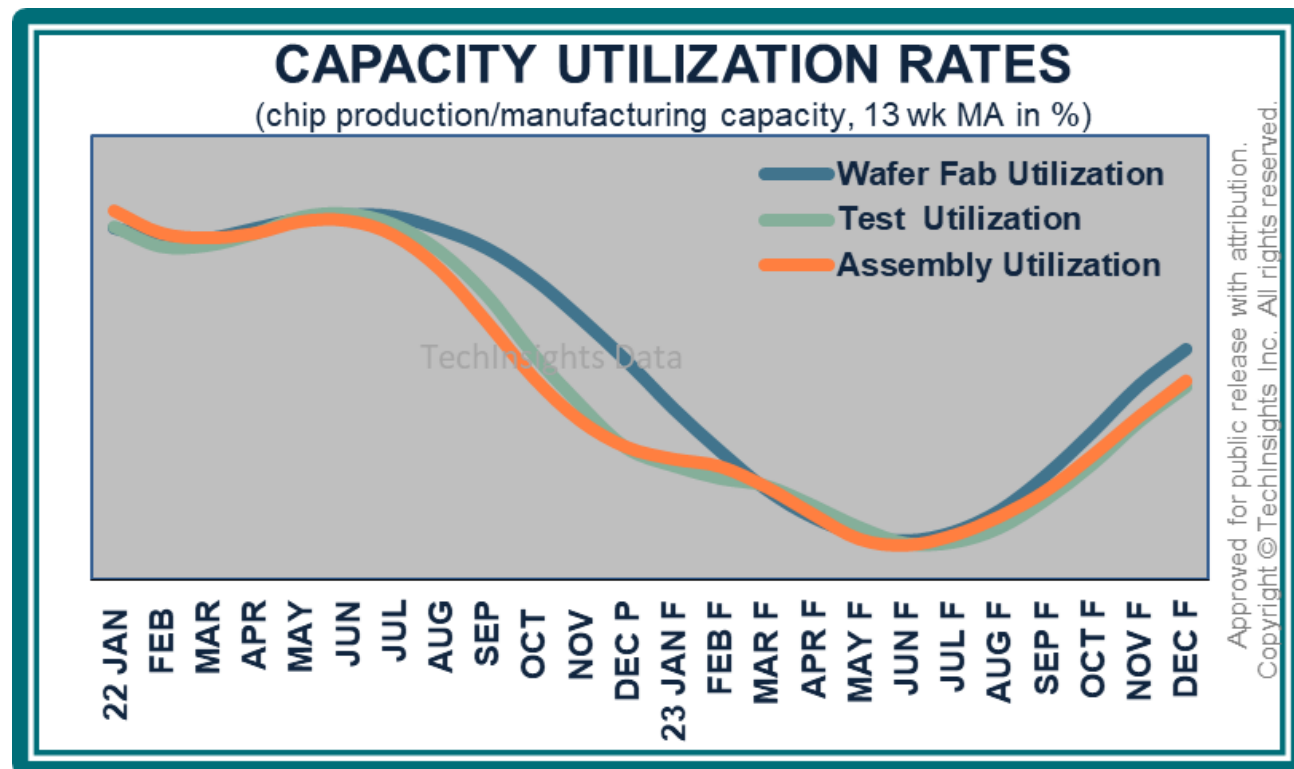


Critical Sub-systems

Updated CSUBS Graphics

Updated CSUBS Graphics file available today on the platform.

Production for semiconductors has slowly declined since July 2022 as high inventory levels combined with slowing demand has left the chip market saturated. This means capacity utilization across the manufacturing process has fallen with utilization rates expected to reach 85% in January before bottoming out later in 2023.





More from SEMI's Great Moments in Semiconductor History

SEMICON Conceived: 2020 marked the 50th Anniversary of SEMI. It all started with the conception of the SEMICON trade show in 1970, a milestone that marks the emergence of the semiconductor equipment industry.

Making Silicon Commercially Manufacturable: Without silicon, there wouldn't be chips. Being able to make sellable wafers starts with the first crystal pulling technology developed in the 1950s and 1960s by Dr. Henry W. Gutsche and Robert Lorenzini.



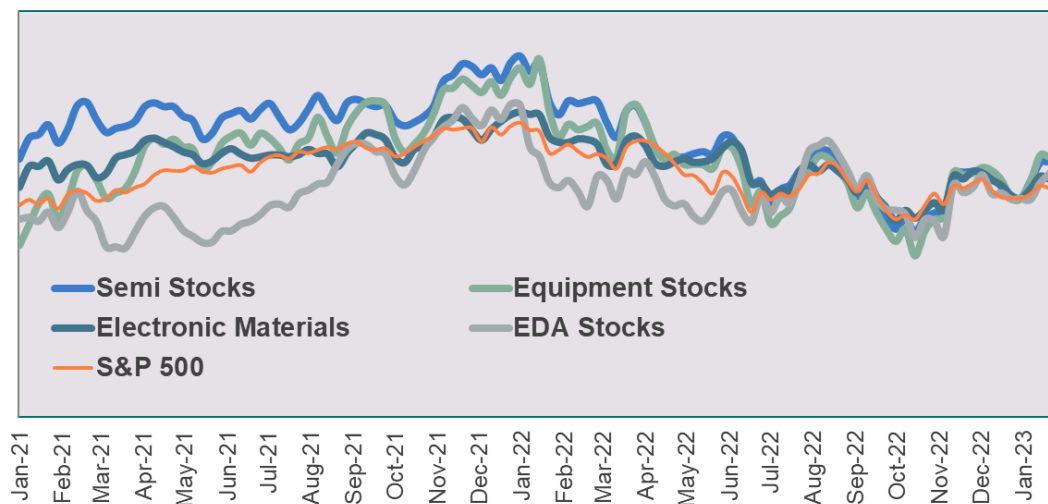


SEMISTOCK WEEK

TechInsights' Semiconductor Stock Indices grew this week with Semiconductor, Equipment, and Electronic Materials indices continue to hit new yearly highs.

Semiconductor Industry Stock Performance Indices

(Stock Prices Indexed to 100 in last week of 2022)



TechInsights' Stock Indices:

Semiconductors +2.8%

Equipment +5.0%

Electronic Materials +1.5%

EDA +1.6%

Semiconductor Stocks

Weekly Growth and Forward P/E Ratios by Company

TechInsights' Semiconductor Stock Index was led up by Silicon Laboratories and AMD after their earning calls along with ON Semiconductor who is expected to beat their quarterly estimate in their earning call next week.

IDM +2.1%
Foundry & OSAT +2.9%
Fabless & Fablite +3.8%

Weekly Gains			2/3/2023		
Semiconductor Stocks	Price Change	Forward P/E	Semiconductor Stocks	Price Change	Forward P/E
IDM			Fab-lite to Fabless		
Intel (INTC)	7.7%	11	AMD (AMD)	14.2%	21
Micron (MU)	-2.3%	34	Analog Devices (ADI)	4.7%	16
ON Semiconductor (ON)	9.8%	16	Broadcom (AVGO)	1.1%	14
Samsung Electronics (005930.KS)	-1.2%	—	IBM (IBM)	1.9%	13
SK hynix (XKRX)	0.8%		Infineon (IFNNY.PK)	5.3%	16
STMicroelectronics (STM)	3.5%	11	MagnaChip Semiconductor (MX)	-0.9%	40
Western Digital (WDC)	-3.8%	16	MaxLinear (MXL)	-1.5%	11
Foundry & OSAT			MediaTek (2454.TW)	8.4%	—
Amkor (AMKR)	1.9%	11	NVIDIA (NVDA)	3.6%	47
ASE (ASX)	0.5%	9	Panasonic (PC)	-6.5%	12
GLOBALFOUNDRIES (GFS)	6.8%	26	Qualcomm (QCOM)	1.2%	11
JCET (600584.SS)	2.3%	15	Silicon Laboratories (SLAB)	15.9%	44
SkyWater Technology (SKYT)	6.6%	—	Skyworks (SWKS)	1.2%	10
SMIC (SMI)	-3.5%	14	Texas Instruments (TXN)	4.0%	20
TSMC (TSM)	1.5%	13			
UMC (UMC)	7.1%	8			

Above Avg

Top 4-6

Top 1-3

Chip Equipment & Related Stocks

Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			2/3/2023		
Equipment Stocks	Price Change	Forward P/E	Equipment Stocks	Price Change	Forward P/E
<i>Wafer Fab:</i>			<i>Test:</i>		
Applied Materials (AMAT)	6.6%	17	Advantest (ATEYY)	4.9%	–
ASM International (ASMIY)	2.9%	28	Teradyne (TER)	4.4%	19
ASML (ASML)	1.8%	28	FormFactor	4.6%	35
KLA (KLAC)	2.2%	22			
Lam Research (LRCX)	9.6%	18	<i>Assembly:</i>		
Onto Innovation (ONTO)	10.5%	–	BESI (BESY.PK)	2.9%	–
Nikon (7731)	-0.8%	–	Kulicke & Soffa (KLIC)	9.4%	14
TEL (8035)	4.4%	–	ASM Pacific Technology (0522.HK)	5.1%	
Veeco Instruments (VECO)	6.0%	16			

Above Avg

Top 4-6

Top 1-3

TechInsights' Semiconductor Equipment Stock Index soared this week. Onto Innovation, Lam Research, and Kulicke & Soffa were the top performers with a higher growth than the rest of the Semiconductor Equipment companies.

WFE +4.8%
Test +4.6%
Assembly +5.8%

Electronic Materials Stocks

Weekly Growth and Forward P/E Ratios by Company

TechInsights' EDA Stock Index continued to increase this week.

TechInsights' Electronic Materials Stock Index also rose this week with Shin-Etsu being the biggest winner.

Weekly Gains					2/3/2023
EDA & Electronic Materials Stocks	Price Change	Forward P/E	EDA & Electronic Materials Stocks	Price Change	Forward P/E
EDA			DNP (7912)	-1.6%	–
Cadence (CDNS)	0.4%	39	DuPont de Nemours (DD)	-0.8%	5
Synopsys (SNPS)	1.2%	30	JSR (4185)	-1.7%	–
Ansys (ANSS)	3.2%	32	Shin-Etsu (4063)	4.9%	–
Electronic Materials			SOITEC (SOI.PA)	3.8%	–
BASF (BASFY)	0.9%	2	Tokyo Ohka (4186)	2.1%	–
Entegris (ENTG)	4.7%	24			

Above Avg

Top 4-6

Top 1-3

The Prior Week's Close	TechInsights' Indices of Chip Industry Stocks				Weekly Growth				Companies Up	Max Growth	Companies Down	Min Growth	Range of Growth	S&P 500	S&P 500 Growth
	Semi Stocks	Equipment Stocks	Materials Stocks	EDA Stocks	Semi Stocks	Equipment Stocks	Materials Stocks	EDA Stocks							
24-Jun-22	105.5	102.3	104.7	101.0	0.8%	4.3%	-0.3%	9.3%	41	12.8%	-14	-19.4%	32.2%	101.9	6.4%
01-Jul-22	97.7	92.0	101.3	95.4	-7.3%	-10.1%	-3.3%	-5.6%	3	6.1%	-52	-20.1%	26.2%	99.6	-2.2%
08-Jul-22	102.8	94.4	102.8	100.6	5.2%	2.7%	1.5%	5.5%	47	20.5%	-7	-4.8%	25.3%	101.6	1.9%
15-Jul-22	104.3	97.1	102.6	98.4	1.4%	2.8%	-0.2%	-2.2%	32	10.1%	-21	-9.1%	19.2%	100.6	-0.9%
22-Jul-22	108.9	105.9	108.5	105.8	4.4%	9.1%	5.7%	7.5%	52	66.7%	-3	-8.3%	75.0%	103.2	2.5%
29-Jul-22	111.4	109.4	110.8	115.3	2.4%	3.3%	2.1%	9.0%	39	12.4%	-16	-9.9%	22.3%	107.6	4.3%
05-Aug-22	114.8	113.6	108.7	116.9	3.1%	3.8%	-1.9%	1.5%	47	33.8%	-8	-17.1%	50.9%	108.0	0.4%
12-Aug-22	115.2	112.9	110.9	118.5	0.3%	-0.6%	1.9%	1.3%	33	22.3%	-22	-17.4%	39.7%	111.5	3.3%
19-Aug-22	111.1	109.2	108.7	114.2	-3.6%	-3.3%	-1.9%	-3.6%	9	17.4%	-46	-8.1%	25.5%	110.1	-1.2%
26-Aug-22	106.3	104.9	106.2	108.9	-4.3%	-3.9%	-2.3%	-4.7%	2	1.1%	-53	-17.8%	18.9%	105.7	-4.0%
02-Sep-22	100.6	97.0	101.7	103.0	-5.4%	-7.5%	-4.1%	-5.4%	1	2.1%	-54	-16.1%	18.2%	102.2	-3.3%
09-Sep-22	103.8	101.8	106.4	107.4	3.2%	4.9%	4.6%	4.2%	50	13.1%	-5	-9.5%	22.6%	105.9	3.6%
16-Sep-22	99.3	95.5	100.6	100.0	-4.3%	-6.2%	-5.4%	-6.9%	4	2.3%	-50	-24.2%	26.5%	100.9	-4.8%
23-Sep-22	93.8	90.3	97.1	96.6	-5.5%	-5.5%	-3.5%	-3.4%	3	1.6%	-52	-15.8%	17.4%	96.2	-4.6%
30-Sep-22	90.2	86.3	92.6	96.2	-3.9%	-4.4%	-4.7%	-0.4%	5	4.7%	-49	-11.7%	16.4%	93.4	-2.9%
07-Oct-22	93.5	90.2	96.2	95.0	3.7%	4.6%	3.9%	-1.3%	46	9.8%	-7	-7.8%	17.6%	94.8	1.5%
14-Oct-22	89.2	81.6	93.7	87.5	-4.6%	-9.5%	-2.6%	-7.9%	8	5.8%	-47	-16.1%	21.9%	93.3	-1.6%
21-Oct-22	93.6	89.5	96.2	93.2	4.9%	9.6%	2.8%	6.5%	45	21.9%	-10	-5.2%	27.1%	97.7	4.7%
28-Oct-22	95.3	93.3	98.6	92.8	1.8%	4.3%	2.5%	-0.5%	42	11.5%	-13	-24.7%	36.2%	101.6	4.0%
04-Nov-22	96.2	94.3	96.3	87.8	0.9%	1.0%	-2.4%	-5.3%	32	20.3%	-23	-21.5%	41.8%	98.2	-3.3%
11-Nov-22	107.8	108.4	107.2	104.5	12.1%	15.0%	11.3%	18.9%	53	37.4%	-2	-8.0%	45.4%	104.0	5.9%
18-Nov-22	108.3	107.5	106.2	101.9	0.5%	-0.8%	-0.9%	-2.5%	24	12.4%	-31	-22.2%	34.6%	103.3	-0.7%
25-Nov-22	108.5	108.1	108.7	103.4	0.2%	0.5%	2.4%	1.5%	36	5.6%	-19	-3.8%	9.4%	104.9	1.5%
02-Dec-22	108.7	109.9	108.2	107.6	0.1%	1.7%	-0.5%	4.0%	38	9.2%	-16	-7.5%	16.7%	106.0	1.1%
09-Dec-22	106.9	108.9	105.9	101.4	-1.7%	-0.9%	-2.1%	-5.7%	15	7.2%	-38	-8.5%	15.7%	102.5	-3.4%
16-Dec-22	103.6	105.8	104.1	101.7	-3.1%	-2.9%	-1.7%	0.3%	10	4.0%	-45	-10.6%	14.6%	100.3	-2.1%
23-Dec-22	100.4	100.0	100.9	99.7	-3.1%	-5.4%	-3.1%	-2.0%	3	1.2%	-51	-10.8%	12.0%	100.1	-0.2%
30-Dec-22	100.0	100.0	100.0	100.0	-0.4%	0.0%	-0.9%	0.3%	20	7.9%	-33	-5.3%	13.2%	100.0	-0.1%
06-Jan-23	105.6	105.5	103.1	99.6	5.6%	5.5%	3.1%	-0.4%	46	17.8%	-8	-4.3%	22.1%	101.4	1.4%
13-Jan-23	111.4	113.8	107.1	104.9	5.5%	7.9%	4.0%	5.3%	53	25.3%	-2	-1.6%	26.9%	104.2	2.7%
20-Jan-23	112.2	113.5	106.5	108.1	0.7%	-0.3%	-0.6%	3.0%	27	5.6%	-27	-6.4%	12.0%	103.5	-0.7%
27-Jan-23	118.2	116.6	111.4	112.5	5.4%	2.7%	4.6%	4.0%	48	19.8%	-5	-4.8%	24.6%	106.0	2.5%
03-Feb-23	121.6	122.4	113.1	114.3	2.8%	5.0%	1.5%	1.6%	44	15.9%	-11	-6.5%	22.4%	107.7	1.6%

Links to Conference Call Transcripts

February 3rd

- [MediaTek Inc. \(MDTKF\) Q4 2022 Earnings Call Transcript](#)
- [Microchip Technology Inc. \(MCHP\) Q3 2023 Earnings Call Transcript](#)
- [Apple, Inc. \(AAPL\) Q1 2023 Earnings Call Transcript](#)
- [Infineon Technologies AG \(IFNNY\) Q1 2023 Earnings Call Transcript](#)
- [Qualcomm Incorporated \(QCOM\) Q1 2023 Earnings Call Transcript](#)
- [Honeywell International Inc. \(HON\) Q4 2022 Earnings Call Transcript](#)
- [Hitachi, Ltd. \(HTHIY\) Q3 2023 Earnings Call Transcript](#)
- [Qorvo, Inc. \(QRVO\) Q3 2023 Earnings Call Transcript](#)
- [Western Digital Corporation \(WDC\) Q2 2023 Earnings Call Transcript](#)
- [Samsung Electronics Co., Ltd. \(SSNLF\) Q4 2022 Earnings Call Transcript](#)
- [NXP Semiconductors N.V. \(NXPI\) Q4 2022 Earnings Call Transcript](#)
- [ASML Holdings N.V. \(ASML\) Q4 2022 Earnings Call Transcript](#)

January 27th and before

- [KLAC Corporation \(KLAC\) Q2 2023 Earnings Call Transcript](#)
- [Intel Corporation \(INTC\) Q4 2022 Earnings Call Transcript](#)
- [Teradyne, Inc. \(TER\) Q4 2022 Earnings Call Transcript](#)



Links to Conference Call Transcripts

- [STMicroelectronics NV \(STM\) Q4 2022 Earnings Call Transcript](#)
- [Lam Research Corporation \(LRCX\) Q2 2023 Earnings Call Transcript](#)
- [Texas Instruments Incorporated \(TXN\) Q4 2022 Earnings Call Transcript](#)
- [NVIDIA Corporation \(NVDA\) 41st Annual J.P. Morgan Healthcare Conference \(Transcript\)](#)
- [Taiwan Semiconductor Manufacturing Company Limited \(TSM\) Q4 2022 Earnings Call Transcript](#)
- [Micron Technology, Inc. \(MU\) J.P. MORGAN 21ST ANNUAL TECH/AUTO FORUM \(Transcript\)](#)
- [Marvell Technology, Inc. \(MRVL\) J.P. Morgan 21st Annual Tech/Auto Forum Conference \(Transcript\)](#)
- [Skyworks Solutions, Inc. \(SWKS\) Presents at J.P. Morgan 21st Annual Tech/Auto Forum \(Transcript\)](#)
- [NVIDIA Corporation \(NVDA\) J.P. Morgan 21st Annual Tech/Auto Forum Conference \(Transcript\)](#)
- [ON Semiconductor Corporation \(ON\) CEO Hassane El-Khoury presents at J.P. Morgan CES Tech/Auto Forum \(Transcript\)](#)
- [Micron Technology, Inc. \(MU\) Q1 2023 Earnings Call Transcript](#)
- [Western Digital Corporation \(WDC\) CEO David Goeckeler Presents at Barclays 2022 Global Technology, Media and Telecommunications Conference \(Transcript\)](#)
- [Analog Devices, Inc. \(ADI\) Presents at Barclays 2022 Global Technology, Media and Telecommunications Brokers Conference \(Transcript\)](#)
- [Marvell Technology, Inc. \(MRVL\) Arete Tech Conference \(Transcript\)](#)
- [Western Digital Corporation \(WDC\) UBS Global TMT Conference Transcript](#)
- [Advanced Micro Devices, Inc. \(AMD\) Arete Tech Conference \(Transcript\)](#)

Links to Conference Call Transcripts

- [ASML Holding N.V. \(ASML\) Presents at UBS 2022 Global TMT Conference \(Transcript\)](#)
- [NXP Semiconductors N.V. \(NXPI\) Presents at Nasdaq 47th Investor Conference \(Transcript\)](#)
- [ON Semiconductor Corporation \(ON\) NASDAQ 47th Investor Conference \(Transcript\)](#)
- [NVIDIA Corporation \(NVDA\) Management Presents at Arete Tech Conference 2022 Conference \(Transcript\)](#)
- [Western Digital Corporation \(WDC\) Arete Tech Conference \(Transcript\)](#)
- [Marvell Technology, Inc. \(MRVL\) Q3 2023 Earnings Call Transcript](#)
- [DuPont de Nemours, Inc. \(DD\) Presents at Credit Suisse's 10th Annual Global Industrials Brokers Conference \(Transcript\)](#)
- [Semtech Corporation \(SMTC\) Q3 2023 Earnings Call Transcript](#)
- [Synopsys, Inc. \(SNPS\) Q4 2022 Earnings Call Transcript](#)
- [NXP Semiconductors N.V. \(NXPI\) 6th Annual Wells Fargo TMT Summit](#)
- [Applied Materials, Inc. \(AMAT\) Presents at Wells Fargo 6th Annual TMT Summit Conference \(Transcript\)](#)
- [NVIDIA Corporation \(NVDA\) Credit Suisse 26th Annual Technology Conference \(Transcript\)](#)
- [Advanced Micro Devices, Inc. \(AMD\) Presents at Wells Fargo 6th Annual 2022 TMT Summit \(Transcript\)](#)
- [Intel Corporation \(INTC\) Credit Suisse 26th Annual Technology Conference \(Transcript\)](#)
- [Honeywell International Inc. \(HON\) Management Presents at Credit Suisse 10th Annual Global Industrials Conference \(Transcript\)](#)
- [Western Digital Corporation \(WDC\) Credit Suisse 26th Annual Technology Conference \(Transcript\)](#)

TechInsights recent uploads

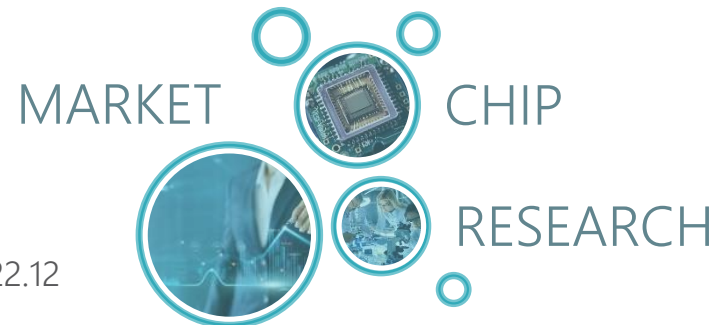
Chip Market Research Services Uploads

ForecastPro Module:

- TCI Graphics – V22.12
- Semiconductor Forecast – V22.12
- CapEx Distribution – V22.12
- Electronics & Macroeconomy – V22.12
- Diffusion Rates and Utilization – V22.12
- Long-Term Semi and Eqpt Forecast – V22.12
- Silicon Demand – V22.12
- Advanced Packaging – V22.11
- Packaging Demand – V22.11

Equipment Database Module:

- Scanner & Stepper Shipments – V22.12
- IC Equipment Forecast:
 - Yearly – V22.08
- WFE Equipment Market Shares:
 - Yearly – V22.05
 - Quarterly – V22.12
- WFE by Applications – V22.09



Customer Satisfaction Survey Uploads:

- 2022 CSS Databases
- 2022 Survey Documents

Critical Subsystems Uploads:

- Critical Subsystems Forecasts – V22.11
- Device Forecast Summary – V23.1
- Manufacturing Equipment Forecasts – V22.11
- Substrate Processing Equipment Shipments – V22.11
- Substrate Processing Equipment Installed Base – V22.11
- Chamber Shipments – V22.11
- Supplier Shares – V22.03

Test Connectivity Reports:

- Test and Burn-In Socket Report : V22.07
 - Quarterly Report: V22.12
- Probe Card Report: V22.05
 - Quarterly Report: V22.12
- Device Interface Board Report: V22.08
 - Quarterly Report: V22.12

Terms and Conditions, Notices, and Disclaimers

By accepting this report, opening it, or using it you are agreeing to these terms. This report contains valuable data, intellectual property, and trade secrets developed or acquired by TechInsights. You have a limited license to hold these materials but do not become the owner of any material. The materials provided are protected by copyright, trade secret, and trademark law. This presentation has been approved by TechInsights for public release with attribution. The information in the materials may be used by you on a limited basis in your own documents provided that those documents are not-for-sale; TechInsights' name, brand, or trademarks are not used to endorse a product or company for sales purposes; TechInsights is clearly referred to as the source of such information; and you obtain written approval prior to use.

This report is provided on an "AS IS," "WHERE IS," "WHERE AVAILABLE," "WITH ALL FAULTS" basis. TechInsights does not warrant these materials or the information provided therein, either expressly or impliedly, for any particular purpose and TechInsights specifically disclaims any express or implied warranties, including but not limited to, any express or implied warranties of TITLE, ACCURACY, NON-INFRINGEMENT, MERCHANTABILITY or FITNESS FOR ANY PARTICULAR PURPOSE OR USE.

The sources of the information in this report include numerous individual reports, memos and bulletins from various segments of the industry, annual reports, financial reports, interviews, questionnaires, surveys, technical symposia, trade journals, technical journals and individual assessments by knowledgeable company or industry representatives as well as our own analysis and judgment. Some companies are more cooperative about providing information than others and some companies decline to provide or validate the accuracy of any information. Although the information provided is obtained or compiled from sources TechInsights believes to be reliable given the oftentimes difficult circumstances under which it is collected, TechInsights cannot and does not warrant or guarantee the accuracy, validity, truthfulness, timeliness, or completeness of any information or data made available to you for any particular purpose. In no event will TechInsights be liable to you or any third party, whether in contract, tort or under any other legal theory, for any direct, indirect, special, consequential or incidental damages, or any other damages of any kind even if TechInsights has been advised of the possibility thereof.

We receive letters and e-mails on current topics covered in our services and/or reports that are of interest to our subscribers, as well as comments on our reports. We value that subscriber input and like to use it. By submitting such material to us, unless you tell us specifically not to publish it, or except to the extent that you give us an embargo date before which you instruct us not to publish it, you authorize us to publish and republish it in any form or medium, to edit it for style and length, and to comment upon or criticize it and to publish others' comments or criticisms concerning it, as the case may be.

This report may contain information concerning stocks that is obtained from the opinions of industry analysts. Quoted past results are not necessarily indicative of future performance. None of the information should be seen as a recommendation to buy or sell any securities. We are not stock analysts or investment advisors. You should contact a registered investment advisor as to the nature, potential, value or suitability of any particular investment action. No information provided is investment advice and any such information is just an opinion and is not tailored to the investment needs of any specific person. Certain statements in this report, other than statements of historical fact, and other written or oral statements made by TechInsights may be forward-looking. In some cases, you can identify forward-looking statements by terminology such as "may", "will", "should", "expects", "intends", "plans", "anticipates", "believes", "thinks", "estimates", "seeks", "predicts", "potential", and similar expressions. Although TechInsights believes that these statements are based on reasonable assumptions, they are subject to numerous factors, risks and uncertainties that could cause actual results and outcomes to be materially different from those stated or projected. Those factors, among others, could cause actual results and outcomes to differ materially from the results and outcomes stated or projected in, or implied by, the forward-looking statements. You should understand that forward-looking statements are not guarantees of results or outcomes. New risks and uncertainties arise from time to time, and TechInsights can not predict those events or how they may affect you, the reader. TechInsights Inc does not have any intention or obligation to update forward-looking statements after the date of this report.

No part of this report may be used in any legal proceedings nor may any of these materials or the information contained therein be disclosed to any third party, including investors or affiliated firms belonging to investors, outside directors or to your affiliated companies, or reproduced or transmitted to any third party, in any form or by any means – mechanical, electronic, photocopying, duplication, microfilming, videotape, verbally or otherwise – without the prior written permission of TechInsights.

The Chip Insider® and the CSS 10 BEST logo are registered trademarks of TechInsights Inc. All other trademarks, service marks, and logos are the property of their respective owners.





Thank You

techinsights.com

Get TechInsights' ChipChirps™ and Semiconductor
WEEK by downloading TechInsights' App for Android
and iOS:



techinsights.com

About TechInsights

TechInsights is widely recognized the world's leading provider of advanced technology analysis and intellectual property services, providing content and services to the world's most successful technology companies.

For over 30 years we have existed to support a fair marketplace where semiconductor and electronics intellectual property can be innovated and monetized.

By revealing the innovation others cannot inside the broadest range of advanced technology products, we enable business leaders to make the best technology investment decisions and prove patent value with fact-based information.

Contact TechInsights

To find out more regarding The McClean report or any of our products and services please visit our website (www.techinsights.com) or contact TechInsights directly at 1-613-599-6500.

TechInsights

1891 Robertson Road, Suite 500
Ottawa, Ontario K2H 5B7
Canada

T 1-613-599-6500

F 1-613-599-6501

Web site: www.techinsights.com

Email: info@techinsights.com